Optimizing Alfalfa Hay Production

Dennis Cash
MSU Extension Forage Specialist, Animal & Range Sciences Department
Bozeman, MT 59717 (voice: 406-994-5688, FAX: 406-994 -5589), dcash@montana.edu

Alfalfa is widely adapted in Montana, and has the highest longevity, hay production potential, and forage quality of all forage crops. Alfalfa acreage and total production has expanded steadily in Montana since the 1920’s, largely due to improvements in irrigation, harvest machinery and adapted varieties. Since 1990, an average of 4.8 million tons of alfalfa hay were harvested on 1.5 million acres with a value of over $256 million, annually (Montana Agricultural Statistics).

Montana alfalfa hay presents an interesting dichotomy. Most (>90%) of Montana’s hay crop (3.5 million tons of “all hay” annually since 1990) is fed on-site. Generally, Montana alfalfa is known for its superior protein and energy compared to hay produced in other regions. High-quality dairy hay drives hay prices and cash hay marketing throughout the West, but not in Montana. Since most Montana alfalfa is fed as winter feed on ranches, hay marketing in the state has been limited. Overwintering, pregnant beef cattle and sheep do not necessarily require high-quality alfalfa hay. Currently, a significant feed industry has developed around supplementing standing dry grass, straw or other more traditionally-viewed “cheap” roughages. Despite this incongruity, producers should grow alfalfa as if it is indeed a cash crop. Some new and growing markets for alfalfa are for new dairies, backgrounding lots, horses, and processing (pellets or cubes).

Steps for Successful Hay Production: For maximum returns, alfalfa producers should strive to establish good stands, maintain high yields, manage forage quality, maintain stand life, and use efficient marketing practices. The first critical step is the selection of a suitable forage crop and its successful establishment. Pure stands of alfalfa are best suited for short (3 to 5 year) rotations for dairy, cash hay marketing or for other high-quality end uses. For most beef cattle producers, the best option for a long-term (5 to 10 years) forage that will be used in a “hay-stockpile” system (fall grazing of stockpiled forage after one or two hay cuttings) is an alfalfa-grass mixture. The predominant grasses under irrigation are meadow bromegrass or orchardgrass. These mixes yield similarly to alfalfa, their forage quality adequately meet livestock needs, stands are more resilient to grazing and they are safer from bloat during grazing. Following are some guidelines for raising a pure stand of alfalfa for hay.

1. Planning: prior to the year of seeding, concentrate on good weed control, soil fertility and stubble management practices that will enable seeding in a timely and efficient manner. Alfalfa establishment during the year of seeding can be in excess of $125 per acre, so optimal hay production the first year can offset these costs. Ideally, a 2 to 3 year-supply of fertilizer (P and possibly K, based on soil test) could be applied to the crop preceding alfalfa before planting or during incorporation of the stubble in the fall.
2. **Choose a “good” variety**: The Montana Agricultural Experiment Station (MAES) routinely tests new alfalfa varieties at its research centers, and the performance summaries are available [here](http://animalrangeextension.montana.edu/Articles/Forage). Secondly, use the publication “Alfalfa Varieties Leaflet” on the above website to choose a variety that has an appropriate level of winterhardiness and pest resistance. For example, the “best” varieties for short rotations in the Yellowstone Valley produce up to 8 tons per year, and tend to be those with a fall dormancy rating of “4” and have good resistance to Phytophthora root rot and Verticillium wilt. A majority of the alfalfa varieties tested by MAES are not statistically different from the highest-yielding variety, but these trials generally assure that an alfalfa is adapted. More importantly, buy high-quality (high PLS, weed seed-free) from local reputable sources. Last, do not buy alfalfa seed solely on the basis of seed price.

3. **Stand establishment**: Be prepared to plant early - on irrigated ground, alfalfa can be planted from late March (some areas) through late July (if under sprinklers). Many cash hay growers routinely cut 2 to over 3.5 tons during the year of seeding by planting early and using post-plant herbicides. When planting early, fungicide-treated (eg. Apron) seed is recommended. The ideal “clear” seedbed is fairly pulverized, very firm and free of too much debris. Seeding can also be successful into cereal stubble, provided that openers and press wheels can provide proper depth and packing. Recommended seeding rates vary widely, depending on method. Assuming a firm “ideal” seedbed, successful stands can be established with 7 pounds PLS per acre with a properly-set drill with depth bands. However, for all broadcasting (Brillion seeder, custom-applied and rolled in, etc.) the seeding rate should be doubled to 14 pounds to accommodate seed that is buried too deep or remains on the surface. Ideally, do not use a cover (“nurse”) crop, and use appropriate herbicide(s) during stand establishment to minimize competition.

4. **Harvest scheduling and management**: The seasonal yield and quality of alfalfa are greatly impacted by the date of first cutting, and the subsequent summer harvest schedule. For high-quality alfalfa hay, swathing or mowing will occur during the late bud stage before any blooms open. For dairies and some commercial hay growers, harvesting first cut as haylage in early June eliminates rain delays, and enables high-yielding and high-quality second and third harvests. For long-term stands, avoid harvesting during the fall “hardening” period (mid-August until October).

5. **Management for persistence**: Timely and optimum irrigation is challenging for most hay producers during the summer. When irrigation is shut down for up to 10 days to accommodate cutting, curing and baling, a 2.5 to 3 acre-inch water deficit often occurs. To minimize these problems, keep haying equipment well-maintained between harvests to avoid breakdowns. The effective use of hay conditioners, rakes, moisture testing equipment and some hay treatments can also
help reduce delays. A major issue for producers in western Montana will continue to be the availability of late summer irrigation water. From 65 to 80% of seasonal alfalfa yield occurs in two harvests prior to August 1, so future water management guidelines will likely be needed.

6. **Pest control**: Monitor alfalfa diligently in the late spring for alfalfa weevil damage, and treat as needed. Aside from the obvious tonnage and forage quality losses of first cutting, delayed development impacts subsequent and total yield for that season. Weed populations should be monitored in every regrowth period. As with the weevil, early detection and control of a pest problem is much more effective and cost-effective. A number of effective “stubble” or dormant herbicides are very effective, but at this stage be sure to consider potential residue concerns for the next crop in your rotation.

7. **Hay storage and marketing**: Hay tarps are a sound investment for any hay that will be marketed more than a month after baling. Tarps reduce nutrient losses, spoilage and bleaching. Stack and identify separate hay “lots” – under 200 tons from the same field cut within 48 hours, and have each lot analyzed for protein and fiber concentrations (ADF and NDF). Hay can be advertised and sold through the Montana Hay Hotline (http://www.agr.state.mt.us/crops/hayFirst.asp), but developing a successful cash hay market may take several years.

8. **“Pulling the plug”**: Alfalfa hay can be an excellent cash and rotational crop. A disadvantage for alfalfa hay in a short rotation (<3 years, eg. with sugarbeet) is that the alfalfa stand is terminated at its peak level of production. At the other extreme, many alfalfa or alfalfa-grass stands are harvested well beyond the stage at which they are still cost effective to maintain.